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READING FLUENCY IN CHILDREN WHO ARE DEAF OR HARD OF HEARING

by

Lisa Emerson

**An Independent Study
submitted in partial fulfillment of the requirements for the
degree of:**

Master of Science in Deaf Education

**Washington University School of Medicine
Program in Audiology and Communication Sciences**

May 21, 2010

**Approved by:
Heather Hayes, Ph.D.**

Abstract: This literature review explores the role of reading fluency in children who are deaf or hard of hearing and the essential role reading fluency plays in reading comprehension. The information gathered in this paper supports the importance of direct instruction of reading fluency with children who are deaf or hard of hearing.

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May 21, 2010

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Epigraph

“Reading fluency is a bridge that connects decoding skills to reading comprehension.”

Pikulski and Chard, 2005

“...a film is made up of still images flashed in rapid succession to simulate movement. Slow down the film, and the movement and meaning slows and the film's impact is diminished. Viewers won't learn as much about the film as if it were shown at normal speed. With reading the same thing can happen. When a person reads word by word, like frame by frame, they are not reading on the level of ideas. You need to read on some level that's more conversational and allows things to coalesce into ideas themselves.”

-Doug Evans

So it is with children who learn to read fluently and well: They begin to take flight into whole new worlds as effortlessly as young birds take to the sky.

-William James

“The more you read, the more things you will know.
The more that you learn, the more places you'll go.”

-Dr. Seuss, 1978

Introduction

Reading is more than just words on a page; it encompasses recognizing written symbols, decoding text, and constructing that text into meaningful information. Over time, a person's ability to read meshes into a fluid synchrony and one can no longer pinpoint each individual skill at work. We refer to such readers as being fluent and they are easy to identify, as a fluent reader "sounds good, is easy to listen to, and reads with enough expression to help the listener understand and enjoy the material." (Clark, 1999) Instruction of reading fluency, an important key for the future reading success of students, has been somewhat ignored in classrooms nationwide until recently. For typically hearing children, research reveals that an absence of reading fluency instruction can have a negative impact on their reading success. Little research has been done regarding reading fluency instruction with children who are deaf. Thus, the goals of this paper are as follows:

- 1) Describe the role of fluency in successful reading comprehension
- 2) Describe assessments and strategies that have been used to improve reading fluency in hearing children
- 3) Suggest strategies for improving reading fluency skills of children who are deaf or hard of hearing.

Reading fluency and its important role in reading comprehension

According to the National Reading Panel (2000), fluency is one of five skills necessary for children to acquire in order to be successful readers. Reading fluency is the ability to read text accurately, automatically, and with proper expression while constructing meaning (Pikulski & Chard, 2005; Gunning, 2010). The noticeable traits of fluent readers are accuracy,

automaticity, and prosody. Such readers have proficient word recognition skills, maintain a steady rate, and apply the correct stress and intonation simultaneously as they read aloud. Each of these aspects contributes to reading comprehension, which is not as observable in oral reading alone. According to Hudson, Lane, and Pullen (2005), a student who is unable to accurately decode words will be unable to understand a given text. Without automaticity, a reader's slow and choppy pace inhibits their comprehension of text. The way a reader with poor prosody groups and expresses words causes confusion. Importantly, the entire purpose of reading is to build meaning from print. An individual who can read with speed, flying over the words with enthusiasm, but then cannot recall what he or she read is not a fluent reader.

There are two theories as to how automaticity and prosody aid in reading comprehension (Kuhn & Stahl, 2000). Automaticity, or the ability to read words accurately and to recognize words automatically, enables a reader to focus on comprehension. Consider a child who reads with precision compared to a child who takes frequent pauses in order to decipher the text. A child's ability to decode text accurately, with speed, allows him to focus on the content of what he is reading. In contrast, a child who must focus all of his attention on decoding words makes frequent pauses and has a choppy and slow reading rate. All of the child's resources are drained once he reaches the end of the text and thus is not able to comprehend what was read. Prosody, the second theory, refers to the expressive nature of a child's oral reading. A fluent reader's prosody indicates comprehension of the text and is reflected in their intonation, emphasis, and rate.

Before the hallmarks of reading fluency (accuracy, automaticity, and prosody) can aid in reading comprehension, there are certain underlying skills that must be in place first. Reading fluency itself is a "complex orchestration of multiple sub-processes working at different levels –

letter recognition to meaning construction.” (Hudson, Pullen, Lane, & Torgesen, 2009) The foundation for children to become fluent readers is laid in kindergarten or preschool when students first begin learning the skills needed to decode text. Hudson et al. (2009) proposed that three sub-processes are the forerunners to reading fluency. First, phonemic awareness enables students to identify the sounds they hear in speech and also to manipulate those sounds. If students are unable to blend sounds heard in speech with fluency, then they will have trouble sounding out unfamiliar words. Second, letter knowledge allows students to recognize the relationship between letters and sounds. Students must grasp that the sounds they hear or say correspond with written symbols. Learning to manipulate these sounds in their written form is necessary for children to become proficient decoders (National Reading Panel, 2000). Third, students must learn to recognize patterns that are common across words. Being able to chunk words based on observable patterns helps students become truly graceful decoders (Hudson et al., 2009).

This group of colleagues (Hudson et al., 2009) collected data on 209 second graders in order to investigate how these 3 skills explained these students’ accuracy and rate when decoding words. The students were measured using a subtest from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) and a subtest from the Test of Word Reading Efficiency (Torgesen, Wagner, & Rashotte, 1999). The authors concluded that:

“Without automatic access to letter-sound relationships, quick and accurate operation of phonemic analysis and blending processes, automatic access to knowledge of phonographs, a large number of words that can be recognized ‘by sight,’ quick access to vocabulary knowledge, and efficient operation of basic information processes, reading fluency (at least the component of fluency involving reading rate) in reading text will

suffer.”

Reading fluency in children with typical hearing

The importance of reading fluency instruction in classrooms nationwide has been neglected until the last thirty years (National Reading Panel, 2000). Past assumptions of reading fluency were that it was a mere side effect of good word recognition skills and did not need to be directly taught. However, research has shown that reading fluency may need to be explicitly taught even to hearing children as one of the five important components of reading (the others being phonemic awareness, alphabetic principle, vocabulary, and comprehension). For example, Speece and Ritchey (2005) conducted a study on the early development of oral reading fluency in normal hearing children. Their sampling was taken from 140 first grade students identified as being *at risk* and 136 first grade students identified as not *at risk*. They measured the students’ letter-sound fluency, oral reading fluency, rapid automatic naming, phonological awareness, and word reading efficiency. The researchers found that a gap begins to form early on in all of these areas between the students who are and are not fluent. The students identified as *at risk* in the fall of first grade were reading on average less than half as many words per minute than their counterparts who were not identified as *at risk*. This study additionally followed the same students through to the end of second grade. Their findings reflected that the struggles the *at risk* students had at the onset of first grade continued to plague their reading acquisition. These results help to highlight the importance of direct instruction of reading fluency—even with hearing children—and the effect that a delay in acquisition of good reading fluency skills has on later reading abilities.

Reading fluency in children who are deaf or hard of hearing

It is not a secret that the majority of children who are deaf have poor reading skills. Traxler (2000) states that the average 17 year-old deaf high school student reads on a 4th grade level. Children who are deaf miss out on a world full of language and sounds because of their hearing loss. As the literature above reflects, phonemic awareness plays a key role in learning to read fluently. Deaf children across the board are at a disadvantage compared to their hearing peers because they cannot implicitly learn the relationship between letters and sounds without direct instruction and access to sound. Additionally, deaf children have limited vocabulary and general background experiences compared to hearing children. Furthermore, many deaf children do not acquire spoken language that is on par with typical hearing peers (Robertson, Wray, Wilkes, Dow, & Geers, 2004). Clearly, there are many factors that negatively influence successful reading acquisition for children who are deaf. However, the advent of cochlear implants has left a noticeable mark on deaf children's ability to achieve reading success.

Following is a small sampling of the literature which describes the success cochlear implant users are having when it comes to reading. A study done by Moog (2002) examined 17 children with cochlear implants between the ages of 5 and 11 years. All of the students used spoken language as their primary communication mode and had attended a private school that focused on teaching listening and spoken language skills. Moog assessed several areas, including reading. The reading assessment compared deaf students' results to those of hearing peers. Of the 17 students who were assessed between 1997 and 2000, more than 70% received reading scores within the average range for their age. In 2003, Geers conducted a comparable study on the word reading and comprehension level of children with cochlear implants. The 181 children in this study were between the ages of 8 and 9.11 years, had been implant users for 4 to 6 years, and were users of either total communication (simultaneous signed English and speech) or oral

communication (speech only). More than half of the children assessed scored within the average range for hearing children. Interestingly, the children who were oral communicators were not significantly better readers than users of total communication. Spencer, Barker, and Tomblin (2003) found similar results in their assessment of 16 children with cochlear implants: On average, the students had lower reading scores than a group of hearing peers, but scored within one standard deviation of the hearing children on a test of reading comprehension. These children were all users of total communication.

Merely receiving a cochlear implant is not in and of itself a guarantee of reading success. The age at which one receives the implant is potentially an important factor. Although not all studies have found an age at implant effect (Geers, 2003), some have. For example, Archbold, Harris, O'Donoghue, Nikolopoulos, White, and Richmond (2008) assessed 105 deaf students, approximately ages 11 to 14 years, who were implanted before the age of 7 years. These students' reading abilities were assessed in the areas of vocabulary, sequencing, and sentence comprehension. This research showed that children who were implanted before a certain age (3.5 years) had a reading age commensurate with their chronological age.

The above literature does draw attention to a drastic improvement in the reading abilities of children who are deaf or hard of hearing and this improvement is presumably due to cochlear implants. Nevertheless, it is important to keep in mind that success is, at best, applied to only some of the children in the varied studies. This means that greater strides need to be made in order to help more students who are deaf or hard of hearing achieve reading success on par with their listening peers.

Although some research has documented the relative success that many children with cochlear implants can achieve in reading, the literature is lacking studies of one specific area of

reading skills in deaf children: oral reading fluency. To my knowledge, there are no studies of oral reading fluency skills of deaf children. This is unfortunate because we know that fluency is an important part of reading for hearing children. Because of the lack of information about fluency in deaf children, teachers of the deaf must look to resources about fluency skills of hearing children. Below, I will describe how reading fluency has been assessed in the regular education setting in order to provide information that professionals may be able to draw upon when considering teaching reading fluency to deaf children.

Reading fluency assessment in the regular education setting

Although there is no research to my knowledge that directly addresses oral reading fluency instruction with children who are deaf or hard of hearing, there is a plethora of evidence-based information used in classrooms to help typically hearing children improve reading fluency skills. The first step in determining whether direct fluency instruction is needed is to assess the current reading fluency skills of the students. The Dynamic Indicators of Basic Early Literacy Skills, or DIBELS, (Good et al., 2002) are a set of standardized, individually-administered measures designed to assess students in each of five basic, early literacy skills. Reading fluency is specifically measured using two subtests: Oral Reading Fluency and Retell Fluency.

The DIBELS Oral Reading Fluency (ORF) measure is designed to assess a student's accuracy and rate of reading grade-level connected text. The purpose of the ORF subtest is to identify students who are in need of instructional assistance. The ORF subtest is strongly correlated with tests of reading comprehension, indicating that more fluent readers are better comprehenders (Roehrig, Petscher, Nettles, Hudson, & Torgesen, 2008). The subtest is repeated over time to monitor the student's progress toward his or her instructional goals. The procedure is as follows.

The student reads a passage that is appropriate for his or her grade level. Prior to reading, the student is encouraged to read not for speed, but for comprehension. They are allotted one minute to read the passage and must stop when time runs out. The facilitator notes the number of words the student read and errors made. Errors consist of pauses that last longer than three seconds, omissions, or substitutions. Students are not penalized for words they self-correct in less than three seconds. The score is the number of correct words read per minute.

DIBELS Retell Fluency (RTF) is used to check the student's reading comprehension. Students are specifically assessed on their ability to retell information from the stories they read during ORF. This requires students to pay attention to the content of what they are reading and not just decode a sequence of words. After reading a story on the DIBELS ORF, the students are asked to retell what he or she just read within a specific timeframe (one minute). The instructor adds up the number of words the student uses to retell the story. Repetition of information or comments that are not applicable are not counted towards the overall RTF score. This measure enables teachers to compare the student's rate of reading to comprehension. A student is considered *proficient* if they meet the established oral reading fluency benchmark and if the student has a retell score that is 25% of their oral reading fluency score. The RTF should only be used with students who are able to read at least 40 words per minute.

Although there are other measures of reading fluency that may be used in regular education settings, the DIBELS provides several advantages over traditional standardized assessments. The fluency assessments are simple and require little training. Teachers are the test administrators, which means that the assessment can be given in the classroom setting. Administration of the fluency measures is quick, requiring only a few minutes of valuable

classroom time. Finally, repeated testing is encouraged (which is not usually the case for standardized assessments) and can help the teacher monitor progress.

Reading fluency instruction in the regular education setting

DIBELS testing provides teachers with the specific area of fluency in which students need help in order to become a proficient reader. Once instructors know where the breakdowns occur (for example, in rate or comprehension), they can use remediation strategies to help students improve. There are many strategies to improving reading fluency that can easily be incorporated into the classroom. Mastropieri, Leinart & Scruggs (1999) outlined several different types including repeated readings, peer tutoring, and previewing.

Repeated readings are quite similar to the way DIBELS' measures of fluency are organized: Students are given the opportunity to read a text more than one time in order help provide familiarity and build automaticity with that text (Mastropieri et al., 1999). Students are typically timed during such readings and their rate of reading is calculated. Tyler and Chard (2000) highlight the benefits of using repeated readings in a specific language arts activity known as Reader's Theatre.

Reader's Theatre is a unique strategy which combines repeated readings and theatre to aid the development of reading fluency in children (Martinez, Roser & Strecker, 2002). Practice in reading fluency skills typically centers on repeated readings of stories in order to help with automaticity of the text. Reader's Theatre provides a different and more meaningful context for reading the same material. Students do not only read the stories so much as they bring the stories to life through performances. This theatrical aspect of the strategy provides students with the opportunity to connect to the characters and events in a deeper way by acting out different roles.

The repetition of learning the text and having to remember it in order to put on a show also builds students comprehension.

Peer tutoring is another instructional method used to improve student's oral reading fluency (Mastropieri et al., 1999). Peer tutoring engages students in either the actual act of oral reading or in monitoring reading. Peer tutoring also gives students a situation in which they can practice reading aloud. By pairing weaker readers and stronger readers together, the struggling readers are presented with an appropriate model. Give and take is important in peer tutoring and each student must be taught how to play both the role of a tutor versus the role of tutee. Students need specific guidelines for how to respectfully correct oral reading errors. What makes peer tutoring advantageous if properly implemented is that all of the students are engaged in a reading task that will help improve their reading fluency skills overtime.

Previewing is a strategy that provides students with exposure to a text prior to reading it. This strategy is useful in that students receive valuable background information they may not have, as well as clear descriptions of vocabulary contained in the text they may not be familiar with (Mastropieri et al., 1999). When previewing a given passage with a student, it is important that the teacher instructs students to follow along with the text. The instructor also needs to read at slow, conversational rate. Following this, the students are given one minute to read the same passage.

The above-mentioned strategies are used in classrooms with hearing children who are assumed to be typical learners. Because deaf children are not necessarily typical learners due to their language delays, it was important to look for information on strategies that are used with hearing children who have other disabilities. A study of literature on effective interventions in reading fluency was conducted by Chard, Vaughn, & Tyler (2002). The studies they reviewed

were from the last quarter of the 20th century and looked at elementary age students with learning disabilities only. Their review highlighted several interventions that have proved beneficial in the reading fluency of hearing students with learning disabilities. Providing students with models of fluent reading before they read on their own is one way to build their fluency. Another way students made improvements in fluency was when they were given corrective feedback in addition to repeated readings. This feedback helped students make fewer errors when reading. Although the research collected could not clearly lay out the relationship between reading fluency and comprehension, it did show evidence that modeling reading to the students helped to increase their comprehension.

Reading fluency instruction in the deaf education setting: Recommendations

The instructional techniques implemented in typical education classrooms, such as discussed above, could easily be modified for reading fluency instruction in the deaf education setting. However, I want to point out that research and strategies for improving reading fluency with the specific population of students who are deaf or hard of hearing does not exist. Therefore, modifications would need to be made in order for successful strides to be made using such methods.

Peer tutoring, as previously mentioned, can have an impact on students' reading fluency because all students are engaged in a reading activity. When it comes to reading instruction with students who are deaf or hard of hearing, however, peer modeling may not be the best approach. The idea of using peers for instructional reinforcement is encouraged in some oral deaf education classrooms, but by the use of hearing peers. This practice (sometimes called reverse mainstreaming) typically only occurs during the preschool years and in classrooms where the language of the hearing peers is not so far above and beyond that of the deaf students that

communication breaks down entirely. If information presented aloud by another peer is not clear or fluent, it makes it that much harder for a deaf child to attend to the auditory information presented and to then make sense of it. Consequently, the majority of students who are deaf are not going to benefit from peer tutoring; they will not be presented with an appropriate model and may not be able to effectively attend to and identify imperfections their classmate makes when reading.

On the other hand, having the teacher model effective oral reading plays an important role in teaching children who are deaf or hard of hearing to read. The deaf educator will make the best tutor, because they will model a proper reading rate and pronunciation of words to the students. Also, when modeling the text to the students first, the teacher has the perfect opportunity to help students understand vocabulary and concepts that are new to them. Both of these will help students when they read the text on their own because they will have heard it and also because they will understand more of what the text is about since it was previewed. Teachers should note that if they want to check students' comprehension of a text, they should not preview the text.

I was afforded the opportunity to observe oral reading fluency strategies with students who are deaf or hard of hearing and who are in an oral school setting. The teacher in this particular classroom conducted daily practice of oral reading fluency through the use of repeated readings. The students' comprehension was additionally assessed by having students retell what they read. I first noticed that the students' pacing had an effect on their comprehension. When I started observing, the students read at what was a relatively fluent rate on the surface. However, once they were finished reading, their comprehension of the text was minimal. Over the course of a few weeks I began to notice that the students were slowing down their pace and in turn their

comprehension was improving. The second thing that caught my attention when observing these students was that the more errors they made when reading (decoding), the less they were able to recall about the story. These errors, conversely, improved during the week as the students read the same story multiple times. A third constructive observation was of the students' ability to comprehend different kinds of text. The students read either expository or narrative types of text. The students were more accurate at recalling information from narrative texts than from the expository texts.

These observations took place during the general day-to-day happenings in an oral deaf education classroom and no data was collected on specific students. Although some recommendations may be made based on these observations in support of the use of repeated readings to teach reading fluency, it is important to keep in mind that they were just observations. One of the most significant observations I made that encourages the use of repeated readings was that of the students' acquired ability to pace themselves accordingly as they read. This was a small glimpse into what makes reading fluency hard to teach. The students were not directly taught that they needed to slow down in order to understand what they were reading. In fact, doing so almost seems like the opposite of being a fluent reader. However, reading fluency is not just about speed and seeing the students modify their rate of reading in order to improve their comprehension was an important step on the road to reading fluency.

The research sampled reflects that reading fluency is crucial for reading success. Although research also reflects that hearing students who are fluent become good readers, future studies will have to be done for us to know how fluent reading impacts oral deaf students' reading abilities. Given their delay in acquisition to sound and language, it would be logical to

assume that students who are deaf are not as fluent as compared to hearing peers. It is up to educators of the deaf to pay attention to fluency in the classroom as part of the many things that deaf kids must acquire in order to be successful readers.

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